

5 What is claimed is:

1. An apparatus for illuminating a license plate of a vehicle, comprising:  
a housing;

a reflector positioned within the housing;

a light emitting diode positioned within the housing; and,

10 wherein the light emitting diode projects light directed at the reflector, the reflector  
having a surface geometry for redirecting the light through a window in the housing such that it  
substantially uniformly illuminates the license plate.

2. The apparatus of claim 1, further comprising a substantially transparent cover for  
the window of the housing.

3. The apparatus of claim 1, wherein the light emitting diode emits white light.

4. The apparatus of claim 1, further comprising an attachment member securing the  
housing to the vehicle near the license plate.

5. The apparatus of claim 1, wherein the light emitting diode is mounted on a  
substrate, the substrate being attached to an interior surface of the housing

25 6. The apparatus of claim 5, further comprising an electrical circuit connected to the  
light emitting diode and a potting material to seal the electrical circuit and the light emitting  
diode.

30 7. The apparatus of claim 1, wherein the light emitting diode is one of a plurality of  
light emitting diodes and the reflector includes a plurality of corresponding reflector segments,  
each reflector segment redirecting light from the corresponding light emitting diode.

8. The apparatus of claim 1, wherein the reflector includes a parabolic reflector  
segment.

5        9.    The apparatus of claim 1, wherein the reflector includes a free-form reflector segment.

10      10.   The apparatus of claim 1, wherein the reflector is substantially smooth.

11.   The apparatus of claim 1, wherein the reflector is integral with at least a portion of the housing.

12.   The apparatus of claim 1, wherein the light emitting diode projects light in a direction substantially to the rear of the vehicle and the reflector redirects the light in a forward direction onto the license plate.

13.   The apparatus of claim 1, wherein the light emitting diode is one of a plurality of light emitting diodes.

14.   The apparatus of claim 13, wherein there are three light emitting diodes, and wherein the reflector is one of three reflectors, each reflector corresponding to one of the three light emitting diodes.

15.   The apparatus of claim 1, wherein the apparatus does not include a lens.

16.   An apparatus for illuminating a license plate of a vehicle, comprising:  
a light emitting diode;  
a curved free form reflector;  
a housing substantially enclosing the diode and the reflector; and,  
wherein the reflector redirects light projected by the diode through a window in the housing toward the license plate.

17.   The apparatus of claim 16, further comprising a substantially transparent cover for the window of the housing.

5        18. The apparatus of claim 16, wherein the light emitting diode is one of a plurality of light emitting diodes.

10        19. The apparatus of claim 18, wherein the plurality of light emitting diodes emit different colors of light that cumulatively create white light.

15        20. The apparatus of claim 18, wherein the plurality of light emitting diodes are mounted on a substrate, the substrate being integral with at least a portion of the housing.

20        21. The apparatus of claim 18, further including a plurality of reflector segments, each reflector segment corresponding to one of the plurality of light emitting diodes.

25        22. The apparatus of claim 16, wherein the apparatus does not include a lens.

30        23. The apparatus of claim 22, wherein the light emitting diode projects light in a direction substantially to the rear of the vehicle and the reflector redirects the light in a forward direction onto the license plate.

35        24. The apparatus of claim 16, further comprising an attachment member securing the housing to the vehicle near the license plate.

40        25. The apparatus of claim 16, wherein substantially no light escapes the apparatus in a rearward direction.

45        26. An apparatus for illuminating a license plate of a vehicle, comprising:  
a plurality of light emitting diodes mounted to a substrate;  
a plurality of reflector segments, each reflector segment corresponding to one of the plurality of light emitting diodes;  
a housing substantially enclosing the plurality of light emitting diodes and the plurality of reflector segments; and,

5 wherein each reflector segment redirects light projected by the corresponding one of the plurality of light emitting diodes through a window in the housing toward the license plate.

27. The apparatus of claim 26, further comprising a substantially transparent cover for the window of the housing.

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28. The apparatus of claim 26, further comprising an attachment member securing the housing to the vehicle near the license plate.

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29. The apparatus of claim 26, wherein the apparatus does not include a lens.

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30. The apparatus of claim 26, wherein the light emitting diode projects light in a direction substantially to the rear of the vehicle and the reflector redirects the light in a forward direction onto the license plate.

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31. The apparatus of claim 26, wherein each reflector segment is an individual reflector.

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32. The apparatus of claim 26, wherein the plurality of reflector segments are all part of one substantially smooth reflector.

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33. An apparatus for illuminating a license plate of a vehicle, comprising:  
a light emitting diode projecting light directed substantially away from the vehicle;  
a housing substantially enclosing the light emitting diode; and,  
lensless means within the housing for substantially preventing light from the diode from escaping the housing in a rearward direction and for redirecting the light through a window in the housing toward the license plate.

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